

STUDIES IN THE RANUNCULACEAE OF THE SOUTHEASTERN UNITED STATES. VI. MISCELLANEOUS GENERA^{1,2}

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In providing a treatment of the Ranunculaceae for the forthcoming *Vascular Flora of the Southeastern United States*, a number of nomenclatural and taxonomic decisions were made which call for additional clarification (see Keener, 1975, for a general rationale governing these studies). This treatment of various smaller genera is deliberately conservative and I have attempted to note those species deserving careful biosystematic study.

Within the southeastern United States, Ranunculaceae is represented by 18 genera and 93 species which compares to 50-70 genera and 2000-4000 species for the world (Buchheim, 1964; Zimmermann, 1965). The following key to the genera native or naturalized within the southeastern United States also includes three genera (*Adonis*, *Helleborus*, *Nigella*) which occasionally escape from cultivation, but are not considered sufficiently well established to be included in a regional floristic treatment. In previous papers I presented notes on *Aconitum*, *Anemone*, *Clematis*, *Consolida*, *Delphinium*, *Ranunculus*, and *Thalictrum*; these genera, although included in the key given below, are not discussed further.

KEY TO GENERA

1. Flowers actinomorphic, the sepals mostly equal; fruit various.
 2. Leaves opposite; styles of mature fruits usually elongate and plumose *Clematis*.
 2. Leaves whorled, alternate or basal; styles of mature fruits not elongate and plumose.
 3. Fruit an achene or utricle; carpels 1-ovuled.
 4. Sepals short-spurred; leaves basal, linear; fruiting receptacles more than 1 cm long *Myosurus*.
 4. Sepals not spurred; leaves various, rarely basal and linear; fruiting receptacles usually less than 1 cm long.
 5. Petals present, usually showy.

¹ Based on a manuscript and notes compiled for the forthcoming *Vascular Flora of the Southeastern United States*. The area covered in this treatment is bounded by and includes Louisiana, Arkansas, Kentucky, West Virginia, Maryland, and Delaware. In general, the format follows Radford et al. (1967). Any suggestions for improving this treatment should be sent to me so that necessary corrections can be made before the *Vascular Flora* is in press.

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6. Petals basally nectariferous; leaves not finely dissected (except in several aquatic species); terrestrial and aquatic *Ranunculus*.
6. Petals lacking basal nectaries; leaves finely dissected; terrestrial (introduced species sporadically escaped from cultivation) *Adonis*.
5. Petals absent, the sepals or filaments often well-developed.
7. Leaves ternately compound or decompose, the leaflets usually distinctly petiolulate; flowers often unisexual . . . *Thalictrum*.
7. Leaves simple, often deeply parted, or if compound, the leaflets scarcely petiolulate; flowers usually bisexual.
8. Leaves cauline, alternate; involucrel leaves (bracts) absent; fruit a dehiscent utricle *Trautvetteria*.
8. Leaves basal, except for the opposite or whorled involucrel leaves subtending the flowers; fruit an achene.
9. Involucrel leaves entire, sepaloïd, closely subtending (less than 3 mm) the petaloïd calyx *Hepatica*.
9. Involucrel leaves compound or deeply divided (the leaflets or segments variously toothed, lobed or dissected), remote from the flowers *Anemone*.
3. Fruit a follicle or berry; carpels at least 2-ovuled.
10. Plants small shrubs; inflorescences paniculate, drooping *Xanthorhiza*.
10. Plants herbaceous; inflorescences not paniculate, the flowers racemose or solitary.
11. Largest leaves simple, variously toothed to deeply palmately lobed.
12. Sepals 3; ovules 2; fruit a berry *Hydrastis*.
12. Sepals more than 3; ovules more than 2; fruit a follicle.
13. Petals absent; sepals petaloïd, usually bright yellow; leaves simple, merely shallowly toothed *Caltha*.
13. Petals (staminodia) 2-lipped, hollow; sepals petaloïd, greenish-yellow; leaves palmate or pedate (introduced species occasionally escaped from cultivation) *Helleborus*.
11. Largest leaves ternately compound to decompose or finely dissected.
14. Leaves variously compound with generally broad, toothed or lobed leaflets; carpels distinct.
15. Petals distinctly spurred; flowers variously colored *Aquilegia*.
15. Petals absent, or if present, not spurred; flowers usually white.
16. Sepals small, not petaloïd, caducous; flowers many, racemose.
17. Carpels 1-8, becoming follicles; flowering racemes elongate, more than 15 cm long *Cimicifuga*.
17. Carpel 1, becoming a berry; flowering racemes short, less than 5 cm long *Actaea*.
16. Sepals conspicuous, petaloïd, not caducous; flowers solitary or few.
18. Petals (staminodia) present, small; follicles long-stipitate; cauline leaves absent *Coptis*.
18. Petals absent; follicles sessile; cauline leaves present *Enemion*.

14. Leaves finely dissected into narrow segments; carpels basally connate (introduced species sporadically escaped from cultivation) *Nigella*.
1. Flowers zygomorphic, the upper (posterior) sepal distinctly unlike the others; fruit a follicle.
19. Upper sepal hooded or helmet-shaped, not spurred; petals 2(-5), entirely concealed by the hooded sepals *Aconitum*.
19. Upper sepal spurred, not hooded; petals 2 or 4, with at least the limbs exerted.
20. Carpel 1; petals 2, united; introduced annuals *Consolida*.
20. Carpels 2 or more; petals 4, distinct; native perennials *Delphinium*.

ACTAEA L., Baneberry

The baneberry genus *Actaea* includes about 10 species widely distributed in the northern hemisphere (Tamura, 1966). Two species are in eastern North America.

1. Berries white (rarely red); mature pedicels stout, more than 1 mm thick; stigmas during anthesis 1-2 mm broad, sessile 1. A. PACHYPODA.
1. Berries red (rarely white); mature pedicels slender, less than 1 mm thick; stigmas during anthesis 0.5-1 mm broad, subsessile 2. A. RUBRA.

1. A. PACHYPODA ELL., White Baneberry, Doll's-eyes

Rich open woods and thickets; all prov. SE except LA. [ALL except Tex. and Okla.]. Incl. forma *rubrocarpa* (Killip) Fern.—Fernald (1950), a form with red fruits; *A. alba sensu* Small (1933), Gleason and Cronquist (1963), *non* Miller (1768).

The taxonomy of the eastern North American species of *Actaea* is fairly well understood. There are two species which differ chiefly in pedicel thickness, and although both species have red and white fruited forms, within a given species one color predominates (cf. key above). Of the two species, however, the nomenclature for the widespread thick-pedicelled species has not been satisfactorily resolved. At issue is whether the name *A. alba* Miller or *A. pachypoda* Ell. should be applied to this species.

When Linnaeus (Sp. Pl. I: 504. 1753) described *A. spicata* var. *alba* he used no specimens, but merely cited two works in which the plant was previously figured: t. 77 of Cornut's *Canadensium Plantarum Historia* (1635) and ii. fol. 1, t. 2, fig. 7 of Morison's *Plantarum Historia Universalis* (1680) both reproduced by Fernald (1940). Later, when Miller (1768) published the name *A. alba* he gave a brief diagnosis and merely cited Morison (but not Linnaeus) and as Mackenzie (1928) pointed out, ". . . it is not correct therefore to write *Actaea alba* (L) Miller." According to Mackenzie (1928), although Miller grew the plant, no specimen apparently has been preserved.

Mackenzie (1928) maintained that the illustrations by Cornut and Morison (who obviously copied his illustrations from Cornut—see Fernald, 1940) rep-

represented an *Actaea* with ovoid racemes and slender pedicels. He concluded that Cornut, Morison, Linnaeus, and Miller all described the slender-pedicelled white-fruited form which is currently called *A. rubra* (Aiton) Willd. forma *neglecta* (Gillman) Robinson. But Mackenzie never followed through on the nomenclature. Instead of applying the name *A. alba* Miller to the white-fruited form of the slender-pedicelled species which would then have become the name for the species, he regarded the red-fruited form to be more natural ("undoubtedly the specific type") than the rarer white form. Consequently, Mackenzie used the name *A. rubra* (Aiton) Willd. for the species. Finally, there being no earlier available name, Mackenzie applied Elliott's *A. pachypoda* to the thick-pedicelled plants.

Fernald (1940) thoroughly reviewed the nomenclatural history of *Actaea spicata* var. *alba* and concluded that Cornut's illustration was not that of a Canadian plant. Moreover, Fernald pointed out that although Cornut's sketch apparently was based on the European *A. spicata* (a species with black ovoid fruits), the phrase "*baccis niveis*" seemingly referred to North American material. Fernald's conclusion was that inasmuch as "the basis of *A. alba* Mill. was confused," the unequivocal name *A. pachypoda* Ell. should be used instead.

Gleason (1944) agreed with the facts set forth by Mackenzie and Fernald, but he differed sharply with their conclusions. In the first place, Gleason argued that greater weight should be given to the *description* of the fruit. Gleason noted that in the description of his species ("*Aconitum baccis niveis* & *rubris*"), Cornut included a statement to the effect that "the white berry became 'orbicularis' at maturity and had a purple spot at the summit." This seemingly implied that the plant was from eastern North America, not from Europe. Furthermore, Linnaeus, having no specimen of the North American thick-pedicelled, white-fruited baneberry, based his variety *alba* entirely on Cornut's description and illustrations. Gleason believed that Linnaeus' diagnosis ("*β. Aconitum baccis niveis. Corn. canad. 76. t. 77*") clearly singled out the North American white-fruited baneberry by eliminating the European black-fruited *A. spicata* and the American red-fruited *A. rubra*. Consequently, Gleason felt that "*A. alba* (L.) Miller" should be the name applied to the thick-pedicelled, white-fruited baneberry of eastern North America.

After reviewing the evidence, I have adopted *A. pachypoda* Ell. for the thick-pedicelled eastern North American baneberry for the following reasons:

1. Fernald (1940) clearly demonstrated that the sketches of both Cornut and Merison illustrate the European *A. spicata* far better than they illustrate either of the two eastern North American species.
2. Linnaeus' diagnosis (Sp. Pl. I: 504. 1753) for variety *alba* ("*β. Aconitum baccis niveis*") is too brief. It could be applied equally well to the common white-fruited thick-pedicelled species (*A. pachypoda*) or the white-fruited form of the thin-pedicelled species (*A. rubra*).

3. Because no type material for var. *alba* is known to have been preserved, and in view of Linnaeus' inadequate diagnosis, I am relying on the illustrations by Cernut and Morison to clarify matters. Because the illustrations and diagnosis apparently refer to two different taxa, it is best to regard Linnaeus' variety *alba* as a *nomen ambiguum*.

4. Miller's diagnosis (Miller, 1768) is also too brief. The only definite points in his diagnosis are the phrase "*racemo ovato*" and a single reference to Morison's illustration. Because no type material has been preserved so far as is known (Mackenzie, 1928), one is again forced to rely on an illustration which more accurately figures the European *A. spicata* than it does the eastern North American plants.

2. *A. RUBRA* (Aiton) Willd., Red Baneberry

Rich woods and thickets; chiefly mts. Reported for W.Va.; to be sought elsewhere in the SE. [ALL except Tex. and Okla.] Incl. forma *neglecta* (Gillman) Robinson—Fernald (1950), a form with white fruits; *A. pachypoda* Ell.—*sensu* Radford (1968), *pro parte*.

Actaea rubra ranges over the cooler parts of North America and probably is a species which recently (in post-Pleistocene time) migrated into eastern North America (Kane, 1966). It has been reported for West Virginia (Fernald, 1950), and Tennessee and North Carolina (Small, 1933), but I have seen no specimens. It should be sought in the cool mountainous regions of Maryland, Virginia and West Virginia (cf. Strausbaugh and Core, 1971).

AQUILEGIA L., Columbine

This genus of about 70 species (Munz, 1946) is widely distributed in the northern hemisphere. There are two species in the southeastern United States, one native and one an introduced escape.

- 1. Spurs straight to curved, not hooked distally; perianth red, yellow or both; stamens conspicuously exerted 1. *A. CANADENSIS*.
- 1. Spurs strongly hooked distally; perianth blue, purple, pink or white; stamens scarcely exerted 2. *A. VULGARIS*.

1. *A. CANADENSIS* L., Wild Columbine

Rich rocky woods, ledges, pastures and roadside banks; all prov. SE except La. and Miss. [ALL]. Incl. *A. coccinea* Small—Small (1933), *A. c.* var. *coccinea* (Small) Munz—Fernald (1950), *A. australis* Small—Small (1933), *A. c.* var. *latiuscula* (Greene) Munz—Fernald (1950).

Munz (1946), who revised the genus on a worldwide basis, recognized five varieties of *A. canadensis* although he admitted that "there is abundant intergradation and many specimens are difficult to place." Until thorough biosystematic studies involving comparative population analyses are undertaken to assess the overall geographic variability, I prefer to recognize

A. canadensis as a wide-ranging polymorphic species.

2. *A. VULGARIS* L.

A garden escape occasionally established along roadsides, waste places and fields; mts. and pied. NC., W.Va. [Pa., N.J.].

Although Munz (1946) provided a key and description to 24 varieties of this species, most seem to be mere trivial variants based on flower color and size, leaflet shape, size and dissection, pubescence, etc. Consequently, no attempt has been made to account for them in our flora.

CALTHA L., Marsh-Marigold

One of the most primitive genera within the Ranunculaceae, *Caltha* is a worldwide, generally extra-tropical genus of ca. 20 species (Tamura, 1966; Buchheim, 1964), one of which occurs throughout arctic and eastern North America and Eurasia.

1. *C. PALUSTRIS* L.

Wet woods, wet meadows, marshes and bogs; chiefly mts. Del. cp., Md., N.C., Tenn., Va., W.Va. [Ill., Ind., Ohio, Pa., N.J.].

This species varies considerably with respect to "habit, size, shape of leaf and follicle and in chromosome number" (Tutin, 1964). Kootin-Sanwu and Woodell (1971) analyzed the cytogenetic relationships of various chromosome races and concluded that *C. palustris* 1) is sexually reproducing with the plants self-incompatible, 2) consists of a number of chromosome races with a base number of 8 [the $2n=32$ race is common in North America; $2n=56$ race the only one in Britain; other races in Europe include $2n=16$, 28, 48, 60, 72 plus many aneuploids], 3) by means of polyploidy, hybridization and obligate outbreeding coupled with vegetative reproduction has become a highly successful species now widely established in wet habitats throughout the northern hemisphere, and 4) "is interesting in that there exist well-defined, partially or completely isolated chromosome races which if morphologically distinct could be regarded as separate species, but which must, on present evidence, be regarded as one." In view that the eastern North American plants are an apparent uniform $2n=32$ race, it would be of interest to analyze those populations consisting of slender plants with small flowers and broadly reniform leaves formerly recognized as *C. flabellifolia* Pursh (Pursh, 1814) [= *C. palustris* var. *radicans* (Forst.) Beck—see Smit, 1973]. For a comprehensive treatment of *Caltha*, see Smit (1973).

CIMICIFUGA L., Bugbane

Ramsey (1965), who studied the genus from a comprehensive perspective, recognized 12 species widely distributed throughout the northern hemisphere, of which three are in eastern North America.

1. Carpels 1(-2), sessile; follicles firm-walled.
2. Follicles ca. 7 mm long, the seeds smooth; petals (staminodia) present; leaflets 20 or more per leaf 1. *C. RACEMOSA*.
2. Follicles ca. 16 mm long, the seeds scaly; petals (staminodia) absent; leaflets 3-9(17) per leaf 2. *C. RUBIFOLIA*.
1. Carpels 3-8, stipitate; follicles thin, papery 3. *C. AMERICANA*.

1. *C. RACEMOSA* (L.) Nuttall, Black Cohosh

Rich moist woods, wooded slopes, ravines and thickets; all prov. SE except La. and Miss. [ALL except Tex. and Okla.]. Incl. *C. r.* var. *cordifolia* (Pursh) Gray—*sensu* Fernald (1950), *pro parte*, and forma *dissecta* (Gray) Fern.—Fernald (1950).

Plants with extremely dissected leaves have been named forma *dissecta* (Gray) Fern., but such variants appear to be unworthy of taxonomic recognition. With respect to variety *cordifolia*, see the discussion under no. 2 below.

2. *C. RUBIFOLIA* Kearney

Wooded limestone river bluffs, ravines and coves; chiefly mts. Tenn. mts. and IP, Va. [Ill.]. Incl. *C. racemosa* (L.) Nuttall var. *cordifolia* (Pursh) Gray—*sensu* Fernald (1950), *pro parte*.

Cimicifuga rubifolia, a relatively rare and poorly understood species, was described by Kearney (1897) to include the unicarpellate, sessile-ovaryed plants with large deeply cordate leaflets which he collected near Knoxville, Tennessee.

Much earlier, Pursh (1814) described *C. cordifolia* which over the years was applied (e.g. by Gray, 1895, and Fernald, 1950) to robust forms of *C. racemosa* with subcordate leaflets as well as elements referable to *C. rubifolia* Kearney (Ramsey, 1965). However, even though Pursh's *C. cordifolia* was apparently based on a plant having deeply cordate leaflets, the type description (Pursh, 1814) clearly points to a species earlier described by Michaux as *C. americana* (Ramsey, 1965). Hence, Pursh's *C. cordifolia* is a synonym of *C. americana* and Gray (1895) and Fernald (1950) simply misapplied the name.

3. *C. AMERICANA* Michaux

Rich moist wooded slopes and coves; mts., rarely pied. Ga., Ky., Md., N.C., S.C., Tenn., Va., W.Va. [Pa.].

COPTIS Salisbury, Goldthread

Apparently a relict genus, *Coptis* consists of about 14 species widely distributed throughout the cooler parts of the north temperate zone (Tamura, 1968).

1. *C. TRIFOLIA* (L.) Salisbury

Rich damp mossy woods and bogs; mts. Md., W.Va. [Ind., Oh'o, Pa., N.J.]. Our material can be segregated as var. *groenlandica* (Oeder) Fassett

[*C. groenlandica* (Oeder) Fern.—Fernald (1950)].

On the basis of available herbarium material, Fernald (1929) treated the plants of Greenland and Atlantic North America as *C. groenlandica* and distinct from *C. trifolia* which he considered restricted to eastern Asia and Alaska. Fernald did remark, however, that possible transitional populations might lead to a reclassification. Hultén (1937), in comparing specimens from the Aleutians and southeastern Alaska, concluded that plants from the Aleutians coincided with material from Kamtchatka, whereas those from southeastern Alaska apparently were more closely related to plants from Greenland. Because of these more or less transitional populations, Hultén treated the material from southeastern Alaska to British Columbia, eastern North America, and Greenland as *C. trifolia* subsp. *groenlandica* (Oeder) Hultén which was later reduced by Fassett (1946) to varietal status. Although I prefer to regard *C. trifolia* as a single wide-ranging species, those who recognize regional variants can segregate our material as *C. trifolia* var. *groenlandica* (Oeder) Fassett.

ENEMION Raf., False Rue Anemone

The delimitation of taxa within the Tribe Isopyreae Schrödinger, demarked by small chromosomes ($x=7$) and follicular fruits (Tamura, 1968), has long been unsettled. Drummond and Hutchinson (1920), who thoroughly reviewed the taxonomic history of *Isopyrum* and its close allies, recognized seven genera, including *Enemion* which was originally described by Rafinesque (1820) to accommodate newly discovered plants somewhat resembling the common Rue Anemone (*Thalictrum thalictroides* (L.) Eames & Boivin). Although Torrey and Gray (1838, p. 29) initially recognized Rafinesque's genus, in the Supplement to their Flora (vol. I, p. 660, 1838) they transferred *Enemion biternatum* to *Isopyrum* as well as firmly delimiting it from the European *I. thalictroides* L. of which it had at one time been considered a mere apetalous form (Drummond and Hutchinson, 1920). In the latest revision of this group, Tamura and Lauener (1968) likewise recognized *Enemion*, along with four other closely related genera (*Dichocarpum*, *Isopyrum*, *Leptopyrum* and *Paraquilegia*). Of these, only *Enemion* lacks petals, which, along with its several free carpels having transverse veinlets, led Tamura (1968) to consider it as the most primitive genus within the Isopyreae.

However, not all recent workers accept the generic segregation of *Enemion*. For example, Calder and Taylor (1963) believe Drummond and Hutchinson (1920) misinterpreted the petaloid structures of *Isopyrum* as petals instead of interpreting them as staminodia and moreover placed “. . . too much stress on their value as characters for segregation of the genera.” Nevertheless, irrespective of whether one wishes to call these structures staminodia or petals (cf. Tamura, 1965; Cronquist, 1968: 81), the taxonomic question is whether the absence of these structures is sufficient for a generic segregation of *Enemion* from *Isopyrum* *sen. lat.*

As recognized in this paper, *Enemion* has six species, distributed in North America and eastern Asia (Calder and Taylor, 1963); one of these, *E. biter-natum* Raf., is in eastern North America.

1. E. BITERNATUM Raf.

Rich moist woods, rare; chiefly cp. and pied. Ala., Ark. mts., Fla., Ky. IP, N.C., S.C., Tenn. pied., W.Va. [Okla., Mo., Ill., Ind., Ohio]. *Isopyrum biter-natum* (Raf.) T. & G.—Small (1933), Fernald (1950), Gleason and Cronquist (1963), Radford (1968).

HEPATICIA Miller, Liverleaf, Hepatica

Although some authors unite *Hepatica* with *Anemone* (e.g. Hiroe, 1957; Hara, 1962; Ohwi, 1965), I regard *Hepatica* as a distinct genus, chiefly on the basis of the position of its involucre bracts which closely subtend the flowers.

There has been some difference of opinion regarding the taxonomic treatment of the eastern North American hepaticas. Current regional manuals (e.g. Fernald, 1950; Gleason and Cronquist, 1963; Radford, 1968) generally recognize two species, *H. acutiloba* and *H. americana*. However, critical studies by Hara and Kurosawa (1958) and by Julian and Cora Steyermark (1950) established that *H. nobilis* Miller *sensu lato* is widely distributed in three disjunct regions in the north temperate zone (Europe, eastern Asia, eastern North America). The European plants are only slightly variable whereas those in eastern Asia are the most polymorphic of all and include the only known tetraploid race (Hara, 1962).

With respect to the eastern North American populations there are two relatively distinct forms, which apparently hybridize where they are sympatric (Steyermark and Steyermark, 1960). On the basis of their herbarium studies, the Steyermarks (1960) concluded that "it is, therefore, a matter of difficulty to distinguish some of the European forms of *H. nobilis* from one or the other of the two American taxa." Intensive biosystematic research, including comparative breeding studies should be undertaken to resolve the evolutionary relationships within the *H. nobilis* complex. However, pending such research, I am following the preliminary work of the Steyermarks in recognizing the eastern North American hepaticas as regional varieties of the European *H. nobilis*.

1. H. NOBILIS Miller

Two varieties are recognized following Steyermark and Steyermark (1960).

1a. Var. OBTUSA (Pursh) Steyermark

Leaves cleft to about the middle of the blade; apex of leaf lobes and bracts rounded to obtuse. Sepals typically bluish (sometimes white or pink). Rich woods and dry upland slopes, often in acid soils; all prov. SE except La. and Miss. [ALL except Tex. and Okla.]. *H. hepatica* (L.) Karsten—Small

(1933); *H. americana* (DC.) Ker.-Gawl.—Fernald (1950), Gleason and Cronquist (1963), Radford (1968).

1b. Var. ACUTA (Pursh) Steyermark

Leaves parted to below the middle of the blade; apex of leaf lobes and bracts acute. Sepals typically whitish. Upland woods and rocky slopes, often in calcareous soil; chiefly mts. and pied. Ala., Ark., Ga., Ky., Md., N.C., S.C., Tenn., Va., W.Va. [Mo., Ill., Ind., Ohio, Pa.]. *H. acuta* (Pursh) Britton—Small (1933); *H. acutiloba* DC.—Fernald (1950), Gleason and Cronquist (1963), Radford (1968).

HYDRASTIS Ellis ex L., Golden Seal, Orangeroot

This monotypic genus (Janchen, 1949; Tamura, 1968), restricted to eastern North America, was once widely used in homeopathic medicine. For example, Lloyd and Lloyd (1884), who devoted over one hundred pages in discussing its botanical characteristics and medicinal properties, estimated that the total annual production (ca. 1880) reached nearly 75 tons of rhizomes and roots. Due to such extermination plus its rather exacting ecological requirements, *Hydrastis* is now quite rare and definitely needs protection.

1. H. CANADENSIS L.

Rich woods, rare; chiefly mts. SE except Ala., Fla., La. [Mo., Ill., Ind., Ohio, Pa.].

MYOSURUS L., Mouse-tail

The specialized and phyletically advanced genus *Myosurus* consists of about 16 species widely distributed in all continents, although it is absent in eastern Asia (Tamura, 1967). Campbell (1952) recognized four species native to North America, one of which (*M. minimus*) also occurs in South America, Europe, Australia, and New Zealand. For a study of reproductive biology, meiotic and mitotic behavior, see Stone (1959, 1960).

1. M. MINIMUS L.

Low fields in alluvial or calcareous soil; chiefly cp. and pied. Ala., Ark., Ky. 1P, La., N.C., S.C., Tenn., Va. cp. [Tex., Okla., Mo., Ill., Ind.].

According to Campbell (1952), *M. minimus* consists of eight subspecific taxa, one of which (subsp. *minimus*) alone occurs in eastern North America.

TRAUTVETTERIA Fischer & Meyer, False-Bugbane

This genus is disjunct in eastern Asia, western and eastern North America (Tamura, 1967), and consists of one to three or more species, depending on the taxonomic treatment.

1. T. CAROLINENSIS (Walter) Vail

Wooded seepage slopes, stream banks and bogs; chiefly mts. Ala., Ga., Ky., Md., N.C., S.C., Tenn., Va., W.Va. [Mo., Pa.].

XANTHORHIZA Marshall, Yellow-root

This monotypic genus, confined to the southeastern United States, is distinguished by its woody habit, drooping paniculate inflorescences and yellow wood (whence the name).

Although a number of authors (e.g. Buchheim, 1964) use the spelling *Xanthorrhiza* (following recommended transliteration of classical Greek in the formation of compound words), I am retaining the spelling originally adopted by Marshall (1785), a practice recommended by Stern (1966, p. 269).

1. X. SIMPLICISSIMA Marshall, Yellow-root

Shaded stream banks, moist woods, thickets and rocky ledges; all prov. Ala., Ga., Ky. mts., Md. cp., Miss., N.C., S.C., Tenn., Va., W.Va.

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